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EDITORIAL

AFTER GRADUATION, WHAT ?

AT this time the future becomes imminently important to those of the graduating year. They find that in choosing the doctor's career for their own they have narrowed down the field but little, so many alternatives open up before them. In general there are four big divisions of the doctor's field of endeavour, the scientific career, general practice, a specialty, and public health work. The graduating year must face the difficult task of choosing between these; of reconciling preference with the need for quick financial returns; or of vainly trying to answer the question, "In which of these careers am I most likely to succeed?"

Scientific medicine has a strong appeal for the ambitious. The big advances in medicine undoubtedly come nowadays from the laboratories, and to be in the forefront of the battle against disease seems to offer a career of great interest, arousing in the mind of each one who elects it, the secret, half ashamed hope that he may become a second Pasteur or a second Banting. He who chooses such a career, however, must remember that there is a very long course of training ahead of him, that well paid jobs are not many, that competition is keen, and that mediocrity is likely to find itself in a company too brilliant. He is also likely to have to postpone matrimony for a few years on the principle that "he travels farthest who travels alone." The man of thirty-five may not thank the ambition of twenty-five for pressing him into a lifetime of unprofitable laboratory work.

General practice has attractions peculiarly its own. It is the human branch of medicine, offering to the right man the chance to become the friend and counsellor, as well as the beloved physician of his patients. Before him bodily infirmity, mental affliction, even spiritual troubles are laid, and in studying the infinite variety of his fellow men he finds his interest, in helping them his joy, and his reward, though satisfactory, is less in money than in the consciousness of doing good works and in the respect of his—one almost says parishioners. In such a role many would like to see themselves, but against the choice of this life work are many considerations. The strenuous life of the general practitioner often ends his career at about fifty-five years of age and effectively bars general practice to any but the physically fit. There is the constant danger of becoming out of date, particularly threatening to the general practitioner who has so much to keep in touch with, and resulting so often, especially in cities, in his becoming only a distributing house whence patients are referred to hospitals and to specialists.

The specialties probably have the most general appeal because they represent a compromise between the scientific and the clinical. They retain the human element at least in part, especially in the broader specialties of general surgery and internal medicine, and yet the field is narrowed down sufficiently for one to keep in touch with new developments and to excel in one's own way. The financial returns are therefore apt to be greater. But here, too, the training is long and often expensive, and in the smaller specialties the human element seems to be almost wanting.

"A boil upon the pinna's brim,
A mere furuncle is to him
And it is nothing more."

Public Health is a comparatively new and undeveloped career in which new opportunities will certainly develop as years go by, especially in industrial medicine. Its appeal is many sided, attracting the scientist, the administrator, the sociologist, and the man who likes steady work on a salary. It is undeniably a most valuable part of the doctor's function.

To an undergraduate about to take the plunge into the dark, cold world, it seems to matter little which career one chooses. Once having made the choice with a proper consideration of individual preference, success is conditioned only by a reasonable application to the end in view, a healthy ambition tempered by an easy going philosophy—and patience.

BRICKS WITHOUT STRAW

MR. E. W. BEATTY, president of the C.P.R., intimated recently that immigration was the hope of the country. It might be more true to say that it is the hope of the C.P.R., when one considers that more people means more travellers on the trains. Immigration is a very real problem but in a quite different way. Our aim should not be to flood this young country with "impedimenta" but to people it with those who are able not only to maintain themselves but to lend a hand to the progress of community interests. Quality rather than quantity we want.

But there is another aspect to the thing. Not simply immigration but emigration presents a problem. We must try to hold our valuable citizens for ourselves. The cry that the youth educated in Canada owes it to the country to stay here smacks unduly of sentimentalism. We must offer him some inducement to stay, even if it be only facilities for, and encouragement in his chosen work. We may not be able to pay handsomely for his work but we should at least give him straw wherewith to make bricks.

It has been estimated that over fifty per cent. of this year's graduating class in medicine are going to the United States. Many would rather stay here but cannot afford it. The Americans will give them straw and so we lose our best men. The man who ranked first last year is in the States; the heads of many of the nursing schools are Canadian nurses; Sir Wm. Osler, Dr. Lewellys Barker, Hamilton Fiske Biggar, Dr. Mustard, all at the very head in their own departments, came from Canada.

There is a law in the States that only an American citizen born in the United States can ever be their president. It has been said that this law is necessary, otherwise the president would certainly be a Canadian. This type of man should be here, not there.

The University of Toronto is a Government institution and is, of course, thereby considerably hampered. Free discussion or criticism of political policies cannot be permitted as it is in privately endowed universities. Those in touch with university situations and directing our course have not a free hand. We must go slowly or we run foul of some unduly exuberant though ignorant layman either inside or outside the house. This has happened before now. So the proposition is a difficult one, and may be solved only by persistence and patience in an effort to get through the heads of the public and their representatives in office the great services that the trained man with proper facilities is able to give to his country. The constant dripping of the water will wear away the stone.

DO YOU EVER THINK?

BASIL LANNEAU GILDERSLEEVE, for nearly fifty years professor of Greek at Johns Hopkins University, was perhaps the greatest classical scholar that this continent has produced. On one occasion he had granted an interview to a young student with respect to an academic appointment. This young man, anxious to impress the professor, said, "Why, I spend fourteen hours a day at my work". Gildersleeve looked up and asked, "And when, pray, do you get time to think?"

This same terse remark might be made in connection with our course in Medicine. Theoretically it gives time for thought, for independent reading, for working up definite topics. In practice, however, we find the time-table filled with routine work, and it is a hectic rush from one lecture or clinic to the next. Sunday ceases to be a day of worship and becomes a day of "rest" or a welcome breather when one may catch up back work. Dr. Ryerson has pointed out the five steps essential to study which is to have permanent results, viz.:

1. The having of an objective.
2. The collection of available data.
3. The selection of valuable and discarding of worthless data.
4. Organization of such valuable facts.
5. Assimilation of this organized plan.

The objective of students is present. Next, armed with pen and note-book he proceeds to collect data and many never emerge from the mass of data to progress further. If, now time were to be found in the final years it is not improbable that the student would use it where it would do most good. He would "set his house in order before departing into a far country"; he would organize his reserves and assimilate the fruits of his years of collection, in order to step confidently out into the cold cruel world for himself when the time came. However, it may be that the powers-that-be are wise, and that in those first few months that follow graduation we shall have time and to spare for quiet meditation.

SAUNDERS NEW BOOKS

BANDLER'S MEDICAL GYNECOLOGY

Dr. Bandler's Medical Gynecology has undergone such an extensive revision that it was absolutely necessary to reset the work from beginning to end. The book will be found a most valuable one because it will enable you to do *in your own office* those very many gynecologic conditions that do not call for operative interference. The diagnoses are made clear for you, the treatments are given in detail, in many cases including valuable *prescriptions*. You are told exactly how to recognize when a condition calls for *operative treatment*.

There is a section of seventy-five pages on the *internal secretions*, giving the very latest development in this rapidly growing field. Here you get results of increased and decreased secretion, the symptoms produced, the diagnostic interpretation of these symptoms, the proper treatment, and, of course, organotherapy. Among others, there are chapters on constipation, taking up dietetic treatment, exercise (illustrated), posture, massage, vibration, electricity, hydrotherapy, and drugs; venereal diseases, gonorrhoea, correct use of the pessary, and a monograph of fifty pages on *nervous symptoms*.

MEDICAL GYNECOLOGY. By S. Wyllis Bandler, M.D., Professor of Gynecology in the New York Post-Graduate Medical School and Hospital. Octavo of 825 pages, with 135 illustrations. Price \$8.00 net.

FOSTER'S EXAMINATION OF PATIENTS

Why has this book met with such instant success? First of all, it is so different from most books on diagnosis. As you know, in recent years laboratory methods have somewhat diverted attention from the fundamentals of sound diagnostic practice—trained senses of touch, sight, and hearing. Dr. Foster's book reverts very sharply to these fundamentals. It might well be termed the *technic* of examination—the “how” of examination. It tells you not only what questions to ask the patient, but the *order* in which they should be asked. It tells you how to take the history, it lists all the points that should be noted, and many of which are frequently overlooked. It tells you the methods to follow and then it translates the patient's answers into clinical terms. Of course, it does not neglect laboratory tests, but uses them to corroborate other findings—the use for which laboratory tests were originally intended. This is truly a book on the fundamentals (*not the elementals!*) of diagnosis. It puts *method* into diagnostic procedure.

THE EXAMINATION OF PATIENTS. By Nellis B. Foster, M.D., Associate Professor of Medicine, Cornell University College of Medicine. Octavo of 253 pages, with 70 illustrations. Cloth \$3.50 net.

VAQUEZ AND LAIDLAW ON THE HEART

This book presents the fruits of the ripe personal experience of Professor Vaquez, who is, without question, one of the world's leading authorities on diseases of the circulatory apparatus. His clinical descriptions are marked by that excellence characteristic of French writings. They are vivid. His discussion of methods of treatment points out the great importance of a thorough knowledge of pathology and materia medica.

With this book many of the difficulties connected with the examination, the diagnosis, and the treatment of diseases of the heart disappear. There is nothing indefinite. The method of procedure in examination is very clearly given, the interpretation of the findings so as to formulate the diagnosis admits of no equivocation, and the course of treatment to follow is laid down precisely.

Dr. Laidlaw, who has translated and edited the work, has added much from his own personal experience.

DISEASES OF THE HEART. By H. Vaquez, Professor in the Faculty of Medicine, Paris. Translated and edited, with additions, by G. F. Laidlaw, M.D., New York City. Octavo of 700 pages, illustrated. Cloth \$9.50 net.

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MEDICAL JOURNAL

OUR PATRONS—THE PEOPLE*

T. W. G. MCKAY, M.D., F.A.C.S.
Medical Officer of Health, Oshawa.

An address to a graduating class in medicine might very well be preceded by a prayer such as that "For those who go down to the sea in ships."

Graduation brings vividly to mind those early voyagers who, in high hope and brave of heart, set forth fearlessly on long journeys, o'er uncharted seas. Perhaps, for our own times the imagery would be more true, if we visioned the recent graduate as a staunch, new, and fully-apportioned ship, leaving the smoking ways, soon to depart on journeys as yet undreamed of, and where still so much depends on the experience, the skill, the guidance of a trusted navigator.

To those who still dream dreams—and may we sincerely hope such dreams may ever be, until falls the curtain of the unknown darkness—already vague wonderings will have come as to where your individual voyagings may lead, and as to how, when you tie up your barque, you will take up your life work, in that noblest of all professions, the practice of medicine. How will you prosper? Rural or urban, city or country practice, which shall it be?

May the spirit of adventure be strong in your hearts!

How many of you have prepared to carry into "the quiet places" of our country that newer, modern, knowledge of scientific medicine with which, now, you are replete, and for which our citizens wait? City life has its glammers, its attractions—persistently beckoning, its stereotyped movements, and its comfort of living. The rural communities have need of you. They call for your service. Mayhap, also, they will return earlier and in greater meed a due reward for whole-hearted effort. Above all, you yourselves require that varied experience of human contacts in life, only to be obtained through that greatest of all studies of mankind—man himself.

Your degrees certify to your proficiency in the study of medicine. Your success in life, your community value, will be attested by that proof, given throughout your life, that practice of medicine is essentially but an applied civics.

The older practitioner may know far less modern medicine than the younger graduate, but his knowledge and understanding of humanity more than compensates. He has pigeon-holed and stored away life-time memories and impressions and deductions of human nature—seen at its worst under the strain of illness, worry and distress, with all its social barriers down. He has seen the struggles with adversity, has had the most intimate confidences told to him, and the soul bared in his presence. He has accepted many a sacred trust. He has become an intimate of the family, a trusted friend and counsellor. Often he has ushered into the world a generation whose offspring, yet unborn, are to come into being under his personal guidance. No one may deprive him of those

*Address delivered before the graduating class at the Toronto Academy of Medicine, January 16, 1925.

secret memories, that business asset of such untold value, unpurchasable and profound. The smaller communities offer unexcelled opportunities for studying mankind, of all classes of society, in a compact form and whole.

Some comfort there surely is in knowing that the world assures you an opportunity for service when starting out for the first adventure on your maiden voyage. Some guarantee there also is of a due disposal of your professional wares, and a reasonable reward for work performed. Opportunity knocks still, and still again, at the door of each young heart. The people in the Republic to the south of us, who delight in figures, state that of their total population of 110,000,000 at least 3,000,000 are sick at all times. From 8 to 13 days of lost time per individual are given up each year to illness. It is probable similar figures will hold true for this Canada of ours. Without these people doctors could not live; without their need for service and skilled help in time of illness physicians could not thrive. In Great Britain it is computed that for every 1,000 people 25 of them are under-privileged and likely to be classed as paupers. It is not probable that in America the number would be as high, but still it is high enough, though many of these might better be classed as improvident.

Preventive Medicine and Public Health have, in the past 15 years, reduced the lost time per individual to between 7 and 9 days in the year. Perhaps, after all, there is not sufficient reason, nor justification for that too common attitude of antagonism on the part of the General Practitioner, towards community health services. The cry of "lost revenue" might better be changed to that of "he who steals my purse steals trash." The State has been helping to reduce our burdens, not to increase them. May it not be possible we also owe a duty to protection, to our more prosperous clientele? Should we not rather work, hand in hand, with protective agencies, for our own good and the common weal?

Disappointedly I have searched through this year's Calendar of the Medical Faculty of our University for a statement which appeared there a few years ago before the multiplicity of calls, in the maze of the approach to a degree in medicine, made demands on that extra space for declaration of directional routes. It ran somewhat as follows:

"The student should remember that his profession will be at least as much a branch of Social Service as of technical, scientific practice, and that upon a number of occasions in his career he will likely be called upon for advice and guidance in matters in which not only his medical skill and knowledge will be involved, but also social, ethical and economic factors, a right understanding of which will often enable his services to be much more effective.

"It is most desirable that the modern doctor should be more than a mere doctor, that he should have a wide outlook and know something of the humanities in the old sense of the term."

Whosoever penned that statement understood humanity, knew also the medical fraternity, and had at heart the best interest of his country. It is rather to be regretted that then, just as now, in the life we live, exigency has pushed aside the philosophy of life.

There is great danger that in our present effort to pick all the fruits of the Tree of Medicine, we may pick up also the windfalls and the culls,

the bitter with the sweet, and ignore that necessary sorting which standardizes the product and guarantees a market.

One of the tragedies of modern life and education is a certain neglect of a true understanding knowledge of citizenship and its practical application in every day life. Let us emulate more the spirit of the ancient Greeks, as is spoken of by Pericles, when he states, "Our citizens attend to both public and to private duties, and do not allow absorption in their own various affairs to interfere with their knowledge of the city's. We differ from other States in regarding the man who holds aloof from public life, not as 'quiet' but as 'useless.'"

Medicine has in its structure many an open window through which the vista changes gradually, even as we are peering out into the twilight. Besides being an applied art, leading ultimately through Therapeusis, (1) to alleviation of suffering, (2) to preservation of life, (3) to life's prolongation, the practice of medicine is also an applied science, leading surely to Preventive Medicine, and glorying in its combats with disease. Medicine, through prevention, is attempting to overcome, to control, and to prevent disease and illness, while striving, also, to eradicate their influences on human beings and on civil life.

Though your receiving of a degree in medicine guarantees an ability to diagnose a patient's illness, it also intimates an understanding of that disease, from the point of view of causation, its method of manifestation, and as well, an ability to take care of the patient.

The attitude of the public toward our services and also toward our personalities, determines very greatly whether we shall be paid in copper, in silver, or in fine gold, or rather in lip-service, or maybe nothing at all. The public cares but little as to how results are achieved, nor does it worry much as to how difficulties are to be met and surmounted. It has, however, a very quick perception of erroneous judgment, diagnosis, treatment, and a very disconcerting aptitude for reference to imperfect recoveries and disabling illness. On the other hand it has an intense appreciation of good work done, and of how the future "life-health-work" cycle will be performed, and as to what will be the future value of the patient to the home and to the State. The public, also, because it is intensely human, understands mankind and his works. It fully realizes that "to err is human." It makes no inconsiderate demand on ability to serve, though often unfortunate in the time it chooses to make an appeal for assistance.

Therapeusis was ever a difficult subject. Its ever-changing ideas, slowly unravelling scientific truth, demand constant application to study, as its true means of approach. Nature herself appreciates our difficulties and in gentleness of heart, through her *vis medicatrix naturae*, may often ease our worries, and allow us the sympathetic approval of a kindly disposed and far-seeing people.

Be not in too great a hurry to unfold to the world the richness of your stores of knowledge and your power to apply it. An observant public takes time to build up its faith. Let your tact, your sympathy, your humanity, your patience, your kindness of heart, be your chief appeal to your clients. Allow them of their own volition, the privilege of appraising your abilities and later of advertising them by good report. If you ring true, "by your deeds ye shall be known" and approved.

One needs time in which to grow fallow, after an intensive period of cultivation of the mind, in the fields of Truth. The fulness of maturing of your judgment and the gradual developing of self-dependence take time. The determination of the true perspective and values of things medical demands patience.

Beware of early attempts at specializing until fully assured in your own mind and heart of yourself and of your choice of a definite field of work.

Get wisdom and understanding of humanity before you attempt the cure of its afflictions and pet sins.

Life in the open, broad spaces is still, as in the days of old, the best school for seers and prophets. Yet, if intending to specialize, do not protract your probation period much beyond that necessary five years, of which general consent approves, before you take up your finally determined life-work. Hospital facilities and post-graduate work make easy the road, but one should never neglect the study of mankind itself.

Sir William Osler is credited with the saying which marks his deep understanding of human nature and likewise, his broad human sympathy:

"Any fool can prescribe a drug, but it takes a wise man to know when to stop."

Very reasonably he might have carried his insight into human nature a step further and have remarked also, "Ability to do surgery is not necessarily a reason for the exhibition thereof, though there be sore tribulation in withholding one's hand."

The public wonderfully appreciates a realization on the part of the physician, that it is composed of human beings, not diseases, which we are primarily trying to heal.

Sometimes one receives an impression that the public feels it is but a field to be exploited, that the medical group acts as if it had a possessory title in the rest of human kind. Destroy and eradicate from your own field of service any such foul growth. Ethics and business fair-dealing, let alone humanity, should deny any reasonableness or right to such an attitude. Preserve and protect the confidence of the public. The true physician is the property of the public he serves, not they of him. Time will force this truism ever deeper and deeper into one's soul. Let us ever remember that saying of St. Paul, "Let him that thinketh he standeth, take heed lest he fall."

Holes there are in the fabric of the body politic which require patching, re-patching and continued observation and care, if we are to best protect our clients and our business interests. Under-privilege, improvidence, neglect are so frequently and woefully related to problems of Tuberculosis, Alcoholism, Venereal Disease, Drug Addiction, Physical and Mental Defect, instability of Character, and the like, that one realizes the requirement of a type of care and supervision much greater than that for the ordinary citizen. These are public questions and rightfully demand your interest. They require not only individual but also community and State effort to secure their solution. Do not let your energies be tied down to the treadmill of work, even though your professional calling be that of "A Glorified Tinker," a repairer of parts. It has been truly said, "He cannot keep fit who labours not to make others fit. Sooner or later their unfitness will prove his calamity."

An important point for remembrance is that Medicine, Nursing and Therapeutics, in the course of their present stride, are failing to keep in touch with the relative ability of the public to pay. Care and treatment are becoming the privilege of the well-to-do, or perhaps their pleasure. That which we provide for them is too often what may be secured by others only through hospitals, municipal and state service. We may abhor the idea of State Medicine, but let us not, in the use of that multiplicity of instruments for diagnosis, of materials for care, of treatments for cure, of standardization of charges, forget the "human touch," and that the scale of reward for work done in other callings varies greatly and directly with the ability to earn. From the aspect of a "Medical Philosopher" man "made perfect in God's image" is full of variations and changing potentiality. So also is his ability to pay. Be careful to arrange the progress of the treatment of your case, so that you do not hamper, financially, the ability of those responsible to pay, nor to allow, as Portia says, "enough to press a royal merchant down and pluck commiseration of his state."

To my own humble mind the sole hope of our own profession, and the sustaining of it in the affection and the trust of the people against the inroads of charlatanism and those varied cults we meet in the course of our practice, is not through our management of immediate conditions of illness, nor of cases requiring surgical procedure, no matter how clever the diagnosis, nor how brilliant the operative success. These things in the mind of the public are always individual conditions, and though appreciated thoroughly at their worth and admired for their results, are not accepted as being part of a general method of care and for the protection of all individuals. For example, intubation for diphtheria was a spectacular and wonderfully happy idea by which to save a few children's lives, but anti-toxin and toxin anti-toxin are the salvation of the children at large.

We, who are deeply engaged in the special duties of our restricted calling, do not always sufficiently realize how great is the supply of literary effort, true, false, scientific, pseudo-scientific, valuable or trashy, which is daily placed before the reading public for their consumption, and is so rapidly changing their acceptances, altering their conceptions of medicine, its function, and the general practitioner.

Do not allow yourselves to be disturbed by stories of the over-exploitation of any certain field, for the practice of medicine may be likened unto "garnering in the fields," where the reaper has passed by, or to placer-mining, where the sands have been repeatedly washed, time and time again gone by. Patience and persistence still reveal the unsuspected, over-looked and hidden golden store.

Your personal attitude toward your professional work and your own realization of service will secure, or perhaps succeed in hiding your material reward. The imprint of your professional standard, and your own personal ability will be left a permanent mark upon your community and its people.

Life, in its human manifestations, is entrusted to our care. "As the twig is bent, so doth the tree incline."

May I be permitted to offer some suggestions as to how best you may take up your chosen calling:

Be careful of the little things. Let your watchword be Care, early Care, still more Care, and ever—Care.

Care of the unborn infant.

Care of the expectant mother.

Care of the new-born babe.

Care of the growing child.

Care of the lusty youth.

Care of the worker at home, at work, and at play.

Care of fatigue, of exhaustion, and of nervous tire.

Care of bodily disease.

Care of recovery and convalescence.

Care of mind and soul.

Care of professional relationships.

And yes, above all—

Care of oneself, with quiet insistence on proper hours for labour, and for rest, of reasonable time for recreation, of due interval for improvement of mind, and that greatest of all comforts, happy, pleasureable, and beneficial association with one's fellow men.

May it be said of all of us:

“Something we have made or done
Has brought delight to anyone,
Yes, know we served our fellow men,
Then we are paid—but not till then.”

SLEEP

D. L. MACLEAN, '25

(From a paper read before the Seventeen Club)

In reviewing the literature referring to Sleep one immediately wonders why so little research work has been done on it. As yet no one with authority speaks to tell us why we sleep, how long we should sleep, what changes occur in us when we do sleep, or why we awaken after once having been asleep. It is probable, however, that the length of time we spend in sleep leaves us quite a safety factor—just as protein metabolic experiments have demonstrated that the most of us exceed our requirements in that direction.

Historical

Going back to Greek mythology one finds “Somnus” was the God of Sleep. “Brother to Death, in Silent Darkness born”—he was the son of Erebus and Nox, and dwelt in a remote valley with his brother Death. History tells us drowsy Somnus used to lie on his couch in one of the inner darkened caves. He was clothed in black garments studded with stars, a crown of poppies on his head and a goblet of poppy juice in his hand. Morpheus, his prime minister, protected him during his slumber, whilst Pleasant Dreams hovered about, and Nightmares lurked in the dark corners. Sleep was always represented as kind and

gentle, the bestower of rest and pleasant dreams, the soother of care and sorrow; in comparison with his brother Mors, who was cruel and merciless, never letting go a prey once seized. So then we read in *Macbeth*:

. "the innocent sleep,
Sleep that knits up the ravelled sleeve of care,
The death of each day's life. Sore labour's bath,
Balm of hurt minds, great Nature's second course,
Chief nourisher in life's feast".

General Discussion

It is said that commonly preceding sleep one has a feeling of mental and bodily relaxation, called sleepiness. It is characterized by a peculiar feeling of weight over the temples, forehead, and back of the neck, causing the eyes to close and the head to droop forward.³ During¹ sleep the eyes are deviated inwards and upwards, the pupils are contracted, respirations become slower and deeper, often rather periodic or nearly Cheyne-Stokes in character.² Glandular activity is decreased; urine, tears, nasal and pharyngeal secretions are lessened. Every one is familiar with the dryness of the cornea which causes one to rub the eyes and remark that the Sandman is coming. Possibly some of the viscera are rather atonic—frequently a full bladder is unnoticed during sleep. The knee-jerks are decreased or absent and there is often a positive Babinski. Beliefs as to the effect of sleep on the circulation differ widely. Some^{4 8} claim a vasoconstriction of the brain occurs whilst others⁵ claim there is a vascular dilatation in the brain the same as elsewhere in the body. The recent work of Prof. McWilliams⁵ offers an explanation for the not infrequent occurrence of cerebral, gastric, or pulmonary hemorrhages during sleep. He found that in an ordinary person the systolic blood pressure fell 15-30 mm. Hg during the first two hours of sleep, and then gradually recovered. Amongst a series of hypertension cases whose average systolic B.P. was 204, the average fall in the first two hours was 44 mm. Hg. At the moment of waking the pressure rose on an average 22 mm. Hg. But the astonishing thing is that during dreams he found the pressure might rise from 130-200 mm. Hg just before the person awoke. It would appear then that marked circulatory changes in sleep might be associated with the changes in one's emotions as shown by the higher rises occurring in the more vivid dreams. During profound sleep consciousness seems to lapse entirely; in light sleep one often dreams. Experiments⁷ seem to show that the dreams are like perceptions arising from the stimulation of one of the sense organs. After one of these has been stimulated the brain goes on associating ideas. A temperature disturbance may cause one to dream of sleighing across an icy field; if it is taste that is stimulated, one may dream of eating something delicious or disgusting. Dreams differ in two ways from consciousness when awake, (*i*) the ideas form a disorderly train of usually very fantastic thoughts, and (*ii*) no matter how fantastic they are one always thinks them true, and they do not call forth the ordinary desire for an explanation.

Mechanism of Sleep

*Anaemia of the Brain theory*²—This is probably most strongly held by Howell and Hill. They preface their remarks by stating that experi-

mental interference with the blood supply to the brain will bring about unconsciousness. They base their belief in this theory on Mosso's experiments and their own on dogs, and Brush and Fayerweather's direct work on man. These show a vasodilatation of the extremities, and, as they think, a loss in the amount of blood in the brain. This might, however, be just as much a result as a cause of sleep. They assume that the periodicity of sleep is due to a rhythmical loss of tone in the vasomotor centre as a result of fatigue; this results in a vasodilatation and then in sleep. The studies of Shephard,⁵ however, show the brain is hyperaemic during sleep. Other critics⁹ of the anaemia theory maintain that greater changes in pressure and volume of cranial blood supply occur throughout the day than occur at the transition from waking to sleep, and are wholly unnoticed. Kleitman's¹⁰ work also disproves this as he could detect no loss of tone in the vasomotor centre after 115 hours of wakefulness, or seven times the normal 16 hour period. The fact that it was impossible to keep awake when lying down in which position the demands on the vasomotor centre are small while it was easy to keep awake when active are also against any theory of this nature.

Toxin Theory—Quite a number of writers have assumed that some special toxin which might be called a hypnotoxin is formed during the waking hours and then inhibits the activity of the cortical cells. Piéron¹¹ has worked out this theory in his book, he has also discussed the other theories based on internal secretions, dehydration, exhaustion of intramolecular oxygen and the various autointoxication theories (lactic acid, cholesterol, CO₂, leucomains, neurotoxins, etc.). None of these as yet can be considered proven, and indeed it is hard to conceive of a narcotic substance that accumulates for hours with scarcely any effect and then profoundly paralyzes one within a few minutes. It is still harder to account for the sudden abolition of all desire to sleep which may follow an enforced awakening.

*Inhibition Theory*¹²—This has been advanced by Prof. Pawlow and his workers. He states that the chief basis of all nervous activity consists of the so-called reflexes and instincts. He divides them into (a) unconditional or instinctive reflexes and (b) conditioned reflexes. He finds that if he rings a bell and gives a dog some food he excites an unconditional reflex, as observed by certain muscular movements, the secretion of saliva and gastric juices. After establishing this reflex he can get the salivary response although no food is given. On repeating this a certain number of times, however, he finds that on ringing the bell he gets no response. Now, of course, this might be due to inhibition or destruction of the reflex. It suffices to say, however, that he has shown it was only inhibited and moreover that this inhibitory process will spread from one conditioned reflex to affect all other conditioned reflexes. Thus he found that every conditional stimulus (bell ringing) as soon as it is used alone not being accompanied by an unconditional one (food) leads early or late to an inhibition of all other conditioned reflexes and then a drowsy state or sleep. The differences in his results were only quantitative and not qualitative. Certain agents produce sleep faster than others, certain animals develop the response faster than others. In brief, then, he found that the isolated stimulus of a

certain group of cortical cells leads to exhaustion, and finally sleep, unless it is interchanged or accompanied by stimulation of other cells.

Neuron Theory—According to Herrick¹³ the neurological basis of sleep is as yet wholly unknown. There are, however, two neurological beliefs, as it were. (i) That a soluble toxin is produced during waking hours—a neurotoxin. (ii) That during sleep the dendrites of the neurones retract toward their cell bodies, and away from the axones with which they had been in synaptic union. Lugaro¹ suggests almost the opposite, as he says there is a uniform linking up of all the neurones and so providing a mass diffusion of all incoming stimuli. Attention is the state, according to him, when all are retracted save those required for the definite purpose.

Kleitman¹⁰ attempts to explain the apparent rise in the threshold for sensory stimulation by postulating a functional break in the sensory side of the cerebrospinal cortex, *i.e.*, like a pyramidal tract lesion. Backing up this, he has the positive Babinski, which after repeated stimuli will finally change to a plantar flexion. He also makes use of the Levels Theory of Hughlings Jackson, which states that the highest levels are affected first, whilst the lower levels, on which the respiratory centre, etc., rest are the least modifiable. The higher levels, whose functions are correctly to analyze and interpret incoming stimuli, are the first affected by alcohol, fatigue and insomnia. Thus, due to this functional break during sleep, sensations do not reach the higher centres, but pass along the lower levels and may result in dreams. These stimuli need not all come from external sources but may come from thirst, hunger contractions, distention of the bladder or rectum, etc. These may become so powerful in time that they pass over the break to the higher levels, where, being correctly interpreted, the person is awakened. This offers the best explanation as to why one awakens.

Intoxication Theory—Kleitman's¹⁰ work shows there is no change in the CO₂-combining power of the blood or plasma, in the red or white blood counts, the blood sugar, heart rate, respiration, basal metabolic rate or temperature after 115 hours of wakefulness. Hence the intoxication, if present, was too mild to produce any change in all the above measureable factors. How, then, could any one postulate intoxication as the cause of sleep after a mere 16 hours of wakefulness?

Relaxation Theory—One must remember that due to the numerical preponderance of proprioceptive impulses the majority of the stimuli pouring into the brain come from the muscles, tendons and joints. When a person lies down, removed from most external stimuli, and relaxes, the greater part of the proprioceptive impulses are removed and sleep occurs. Fatigue favours the relaxation of tired muscles and so induces sleep by cutting down the number of proprioceptive impulses. Extreme fatigue is known to prevent sleep and this can readily be understood if one recalls that such fatigue is painful, and painful stimuli pouring into consciousness tend to keep the person awake. This helps explain the long sleeps of young animals and infants; also how people can fall asleep amid the din of battle if they are tired enough to relax their musculature. On the other hand, no one fell asleep during the long dancing marathons of a year or so ago.

In conclusion, then, one might define sleep as the suspension of the sensori-motor activities that bring the living being into relation with its environment. It is characterized by a marked diminution of muscle tone, with the exception of the sphincters and a few other muscles, and a loss of equilibrium; by an abolition of spontaneous activity; a raising of the general sensibility and reflex activity; and by a complete absence of analytical ability as regards interpreting the sensations.

"It covers a man all over, thoughts and all, like a cloak. It is meat for the hungry, drink for the thirsty, heat for the cold, and cold for the hot. It is the current coin that purchases all the pleasures of this world cheap, and the balance that sets the king and the shepherd, the fool and the wise man, even.

"Now blessings light on him that first invented this same sleep."

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JOHN IRWIN HUNTER, M.D.

A. H. WALKER, '29.

John Irwin Hunter, M.D., Professor of Anatomy in the University of Sydney, N.S.W., and a brilliant contributor to medical science, is dead. The man whose remarkable genius, evidenced in various reseaches, made him, at the time of his death, though only twenty-six years of age, internationally famous, died in University College Hospital, London, on December 10th, a victim of enteric fever.

Dr. Hunter was by no means unknown to the medical profession in Toronto. As recently as November 5th, 1924, he addressed the Academy of Medicine. It was on this occasion that a more intimate knowledge of Dr. Hunter's work was gained locally. His subject, "The Significance of Sympathetic Innervation of Striated Muscle," was one on which he had made several important findings.

The story of Dr. Hunter's meteoric career is truth which is stranger than fiction. He received his elementary education at Albury and Sydney, and at the age of sixteen was errand boy for a Sydney business firm. It is a tremendous step from errand boy to University professor, especially so when the boy is without the necessary funds for a college education. However, thanks to winning a state bursary, shortly after starting in business, John Hunter was enabled to enter the University at Sydney in 1915. His remarkable ability early asserted itself and he was able to con-

tinue his studies with the aid of scholarships which he won, and money which he earned as a coach. Even with this aid he experienced very considerable hardships. Besides having to earn funds for his own education, he had to help provide for his mother who had sacrificed much on his behalf during the early years of his life.

In 1917 he enlisted for overseas service, despite the fact that the Ministry of Defence had proclaimed that medical students were expected to continue their studies. He had completed his military training and was about to sail with the troops when he received orders to return to college. It is supposed that the Dean of the Medical College informed the Ministry of Defence that Hunter was an exceptional student.

In his first two or three years he did not distinguish himself, save for his keen application, but even then he was recognized as a man of more than average ability. During the last two years of his course he served as demonstrator in anatomy, and was keenly interested in neurology, especially in the sympathetic system, which proved to be the field of his greatest achievement. While still an undergraduate he obtained the Sandes Prize in surgery for an estimable article called "An Interpretation of Abdominal Pain."

Dr. Hunter graduated in 1920 and simultaneous with his graduation began a career which was phenomenal in its brilliancy and tragic in the briefness of its duration. Nine months after obtaining his degree he was appointed Professor of Anatomy at Sydney, succeeding Professor Wilson who resigned the position to take the chair of Anatomy at Cambridge. This appointment came close on the heels of two others, the first, that of Senior Demonstrator, and the second, that of Associate Professor of Anatomy at Sydney. Another evidence of the man's marvellous ability is that in addition to performing the duties of his position, he accomplished three important researches in the utterly different fields of Embryology, Anthropology and Physiology. He cleared up many of the difficulties in the interpretation of ovarian pregnancy; in the real significance of the occurrence of neanderthaloid characters in aboriginal Australians, and in analyzing the complicated factors of spinal shock following transverse section of the spinal cord.

By means of a series of ingeniously devised experiments he attacked the difficult problem of deciding whether or not vascular disturbances played a part in determining spinal shock. He showed that variations in the ultimate results after section of the cord cannot wholly be explained by release of function alone. There may be combined with release of function (due to section of the conducting pathways) vascular changes leading to rapid degeneration, or a temporary stage of hyperexcitability of the nerve cells. The experience gained in this investigation proved valuable in 1922, when, with Mr. N. A. Royle, Dr. Hunter made researches regarding the sympathetic innervation of striated muscle and the central control of muscular tone. Previous to beginning this work, Dr. Hunter spent eighteen months in Britain, Europe, America and New Zealand, getting in touch with the medical schools of the world.

Dr. Hunter did work which shed important light on the problems of evolution. He showed that the occipital region of the Piltdown skull, properly reconstructed and orientated, presents a much closer analogy to the condition found in the new-born African anthropoids than does any

other human skull. By showing there is no disharmony between skull and jaw he has eliminated the chief factor in a controversy which has been raging for ten years.

Upon his return to Australia he embarked upon the task of solving the problems of muscular tone, which hitherto had defied leading physiologists and neurologists. Mr. Royle, who for some time had been endeavouring to relieve spastic paraplegia by surgical means, came to Dr. Hunter with his difficulties. Dr. Hunter, knowing that sympathetic fibres to striated muscle did not go to the same muscle fibres as the medullated nerves, suggested that they cut the sympathetic supply to an animal's limb and study the result. That form of tone called "plastic" was found to be controlled by the sympathetic nerve, whereas, "contractile" tone is a function of voluntary and contractile fibres innervated by medullated somatic nerves. This fact led Hunter to suggest the operation for the alleviation of those cases of spastic paraplegia due to excess of plastic tone. It can be used not only for voluntary but also for visceral muscles. The technique of the operation, which has been attended by marvellous results, was devised by Dr. Hunter. He continued his researches and discovered several features regarding the regulation of plastic and contractile tone. It was while in England to demonstrate his new vision of neuro-muscular function that he died.

It is distressing to consider what the world has lost in his passing. The great good which would have followed the results of his investigations, had he been permitted to continue, can hardly be estimated. Though he himself was denied the years lesser men have attained, his name will never die, for so long as medical science exists will John Irvine Hunter be remembered.

PURGATIVES IN CHRONIC CONSTIPATION

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The question at once arises, what is meant by constipation? Some people seem to be in perfect health whose bowels do not move oftener than once weekly, while others appear to require two or even more evacuations each day if they would feel well. In most individuals one motion each day is the normal condition. Constipation may be said to exist in a given case when the bowels do not move as frequently or as thoroughly as has been their usual habit. With the condition so defined let us look for a moment at the different forms of it, for these are numerous. Such an etiological grouping as the following may be as useful as any.

Varieties of Constipation Classified According to Causation.

1. Nervous, such as bad habit, loss of tone in the lower bowel, etc.
2. Errors in diet: (a) insufficient debris; (b) insufficient water; (c) astringency.
3. Deficiency of bile, pancreatic or intestinal secretions.

4. Too great absorption of water from the intestine, as occurs in severe sweating and in diabetes.
5. Obstruction of the bowel from (*a*) foreign bodies, hard faeces, or tumours in or pressing upon the bowel; (*b*) spasm of a portion of the gut; (*c*) paralysis of a segment of the tract.

In chronic constipation often several causes may be at work. Thus the patient may have acquired the bad habit of not going regularly to stool, may be taking a too concentrated diet, and may have a hypotonic lower bowel.

Normal defaecation depends upon two factors—a sufficient tension in the rectum and a normal reflex mechanism. The common causes of constipation are two, (1) either the contents of the upper bowel do not reach the lower one in sufficient amount, or (2) when they reach there they are not expelled because the tension is not great enough or the reflex is inactive. In normal people the rectum is usually empty, and when material enters it from above a sensation is at once produced from the stretching of the muscular wall of the rectum which is interpreted by the brain as a desire to defaecate. If this desire be resisted very soon the rectal wall relaxes and thus the tension is lessened and the desire disappears although the contents are still there.

Constipation and intestinal toxæmia are often associated but the relationship is little more than casual. One sees an individual go for days and even for weeks without a motion of the bowels and yet be quite free from any symptoms of toxæmia, and again may come across one who is severely poisoned and yet his bowels are moving freely and there may even be profuse diarrhoea. The intestinal endothelium if undamaged will resist the passage of toxins through it to a marvellous extent, but let it be damaged from some cause and it may become permeable and toxæmia follows. Any irritants produced in the gut by infection or introduced from without, as in the case of drastic purgatives, cause a state of catarrh and then, the normal protective coat of endothelium having been damaged, toxins will diffuse through. The essential cause of intestinal toxæmia is undoubtedly an increased permeability of the mucous membrane of the bowel.

When the intestinal contents leave the small bowel they are quite fluid but now the water is rapidly absorbed so that they reach the sigmoid flexure and rectum in a semi-solid state. If from any cause peristalsis is increased then these contents are hurried to the lower bowel before most of the water is absorbed and so reach there in a too fluid state. Most purgatives, excepting the salines, act by increasing peristalsis and hence fluid stools occur because the contents have reached the rectum before there was time for the normal absorption of water to occur. The rate of absorption of water varies in different individuals and when it is too active the bowel contents too soon become solid and the stools are small and hard.

Nearly all cases of chronic constipation can be successfully treated by the removal of the cause. Thus in the very common one of bad habit if the patient be urged to go to stool at the same hour every day and at no other time, it will be found that after some days of perhaps alternate success and failure the bowel will begin to get into the regular routine.

If the diet be at fault it can be regulated and changed to one containing more cellulose which will increase the debris. Fruits are laxative largely on account of the vegetable salts that they contain. An abundance of water, especially between meals and on rising and retiring, tends to make the stools fluid.

Most cases of chronic constipation are due to a want of tension in the rectum so that although contents have reached there they do not set up the act of defaecation. This type is called *dyschezia*. The necessary tension may be achieved either by an enema or by a purgative which will increase the quantity of contents present or else by drugs which heighten the tone of the muscular coat of the lower bowel. Or an irritating substance such as glycerine may be injected or used as a suppository with the object of stimulating the reflex. Soap acts in this way and a suppository of it is very useful in the constipation of infants.

Purgatives produce their effects either by increasing peristalsis or by increasing the fluid contents of the bowel which again tends to enhance peristalsis. It is very doubtful if any of them directly stimulate the secretion of *succus entericus*. Very severe cathartics may induce an inflammatory exudate but such an effect is never of therapeutic significance. The salines certainly increase the total fluids in the bowel but this is merely by salt action. Most of the other purgatives increase peristalsis by reflex action through the plexus of Auerbach and thus hurry on the contents so that they reach the lower bowel with less time for absorption of water than usual. Some laxatives, such as agar-agar, merely increase the bulk of the contents, while bland oils soften these contents and also probably lessen the normal absorption of water.

Certain cases of constipation are due to local spasm of some part of the bowel wall producing obstruction (and X-ray work tends to show that these are by no means rare), and such are best treated by belladonna combined with drugs or food that soften the contents.

Purgatives have been variously classified. They are often divided into laxatives, purgatives and drastics, according to whether their effects are gentle, moderate or severe, but these results are largely a matter of dosage. Perhaps as useful a classification as any is the following, as it takes cognizance of certain well-marked pharmacological relations and is based upon their chemical connections.

1. Purgatives containing derivatives of anthraquinone, often spoken of as the anthracene group. Such are rhubarb, senna, cascara sagrada, aloes and rhamnus. Also synthetic anthracene forms such as phenolphthalein.

2. Vegetable cathartics containing resinous glucosides and acids—jalap, podophyllum, colocynth, scammony, gamboge and elaterium.

3. Cathartic oils—castor oil (ricinoleic acid), and croton oil (croton-resin).

4. Salines—the salts of sulphuric, phosphoric, citric and tartaric acids.

5. Mercurials.

6. Sulphur.

7. Substances acting physically, such as agar-agar, mineral oils and even water.

The anthracene group appear to act chiefly by promoting peristalsis of the large bowel and are very commonly used in chronic cases. They

cause little irritation of the mucous membrane. Rhubarb contains also a considerable amount of tannic acid and hence its use is apt to be followed by increased constipation.

The resinous cathartics work by irritating the mucous membrane and thus inducing peristalsis. In considerable doses their effect is liable to be severe and to cause catarrh and in large amounts may even threaten life. The presence of bile seems to be essential to their action and hence they are not indicated in cases of obstructive jaundice. These resinous purgatives are often combined in small amounts with the first group in order to enhance the effects of these.

The cathartic oils owe their purgative action to ricinoleic acid and croton-resin respectively, which are set free by saponification in the small bowel. As a rule, however, some of the active principles are free in the oils, especially in the case of croton oil, and are apt to irritate the stomach. Very fresh castor oil may be quite bland with little purgative effect. I recall the fact that the natives working in a castor oil factory in India used to drink the oil freely without any purgative effect. They apparently took it as a food. Both croton and castor oils act specially upon the small intestine. The ordinary dose of castor oil, four to eight drachms, produces just as great a purgative effect as do larger amounts. If more be taken it is merely swept through the alimentary tract. When more than the medicinal dose of croton oil is taken, however, the action may be very severe and even a fatal enteritis may result.

The salines produce little or no irritation of the intestinal mucous membrane, but by disturbing the osmotic balance between the bowel contents and the surrounding tissues increase the watery contents of the former. In most instances it is the acid radical ion which determines the purgative action, although some of the bases, notably magnesium, have some effect. The cathartic action of an ion depends upon the time required for its absorption. The kations potassium, sodium and lithium are quickly absorbed from the small intestine, calcium more slowly and magnesium the slowest of all. Of the anions, the chlorides are most rapidly taken up, then the bromides, iodides, nitrates, and most slowly of all the sulphates. Hence one would expect that such a salt as sodium chloride would be very slightly purgative and such a one as magnesium sulphate would be much more so, and this is found to be the case. The salines produce little peristalsis and thus where the patient is at rest should be combined with an anthracene or resinous body in order that the contents may be hurried on to the pelvic colon before much water is absorbed.

Mercurials, in the form of calomel or of blue pill mass, are decidedly purgative. Metallic mercury and calomel are insoluble substances but when they reach the small intestine are slowly changed into a soluble form and this irritates the mucous membrane and hence produces increased peristalsis, and in some obscure way delays absorption of water. The stools following the administration contain more bile than before, but all workers are agreed that mercury does not increase the secretion of bile—is not a true cholagogue—and it may be that the extra bile in the stools is due to an antiseptic action of the drug which lessens the decomposition of the bile in the upper bowel, or possibly it is because

there is some reflex contraction of the bile passages which causes a greater expulsion of the bile that they contain.

Mercury acts most efficiently when given in small repeated doses.

Sulphur is a useful mild laxative. Its action depends upon the formation of sulphides which cause a mild irritation of the mucous membrane, especially of the lower bowel. The sulphur lozenges of the B. P. are very useful in young patients, as is also the official confection.

Agar-agar (Japanese isinglass) was a fashionable laxative a few years ago and is still used. It swells up from the absorption of water and increases the bulk and softens the faeces. Mineral oils, which at present are so much used, act purely mechanically in that they mix with and soften the contents of the bowel. They also lessen absorption of water and thus assist.

Some purgatives cause catharsis when experimentally given subcutaneously or intravenously. It is probable that they are excreted by the bowel and only then exert their usual effect. This method of administration is not used in the treatment of disease.

Lastly, it should be mentioned that strychnine is a useful addition to purgatives used in chronic constipation. It is in no way a direct purgative but no doubt acts by increasing reflex action and tonus and thus both enhances peristalsis and also raises the tension in the pelvic colon which is so necessary for the production of the reflex of defaecation. This concludes a list of the drugs most commonly used in the treatment of chronic constipation, and it should be again emphasized that when employed they are only a means to an end which is the getting of the bowels to act without their aid. This is nearly always possible through discipline, exercise and regulation of the diet. The purgative habit is all too common and should be frowned upon by the medical profession.

AN HISTORICAL OUTLINE OF APPENDICITIS

GEO. C. STEVENS, '27.

The year 1866 marks a turning point in the consideration of morbid conditions occurring in the right iliac fossa. Prior to this year many different abdominal disorders localizing in the right iliac region were recognized, and were known by as many different names. Thus perityphlitis, caecitis, etc., were names which littered the contemporary literature on abdominal diseases of this period.

In 1866 a Boston surgeon, one Reginald Fitz, in an article published in the *American Journal of Medical Science* of that year, by a clever recapitulation of the facts known up to that time, and a comprehensive report of a large number of cases coming under his own observation, so far changed the conception of right iliac disorders as practically to inaugurate a new school of thought on those conditions. A brief résumé of the various advances made in knowledge of the condition we now know as appendicitis will give a more clear understanding of the importance of the correlations and deductions made by Fitz, when viewed in

the light of our present advanced understanding of appendicular derangements.

As early as 1711 a German anatomist, G. Wirgman, records a dissection made on the body of a malefactor in the public theatre at Altdorff. To quote: "I found the small guts very red and inflamed in several places," and a little later, "but when I was about to demonstrate the situation of the great guts, I found the vermiform process of the caecum prenaturally black and adhering closer to the peritoneum than usual. As I was about to separate it by gently pulling it asunder, the membrane of the process broke and discharged two teaspoonfuls of matter."

He generalizes his finding rather shrewdly. "This instance may stand as a proof of the possibility of inflammation arising and abscess formation in the appendix, which I have not observed to be noticed by other writers, and when in practice we meet with a burning pain where the part is situated, we ought to give attention to it."

Mestivier, a Frenchman, writing in 1759, gives us the first record of appendicitis observed during the life of the patient. This particular case is by way of being a classical one, and might well stand a little detail at this point.

An elderly man sought relief for a growth in the right side of the umbilical region. Fluctuation was detected and a pint of pus was subsequently evacuated by incision. The wound readily healed by first intention, but unfortunately the patient later succumbed. Coming to autopsy the caecum was covered with small gangrenous patches, and the vermiform appendix was found to contain a very rusty and corroded pin.

To quote the report: "It is easy to understand that although the patient had never spoken of swallowing a pin, the one in question had been concealed for a long time in the vermiform appendix of the caecum, and that it was undoubtedly this which had irritated the different coats of which the organ is composed and given rise to all the patient's symptoms, finally causing the death which ensued."

Joubert Lamotte, a French medical student, in 1766 describes a case in which the patient died with supposed intestinal obstruction. The autopsy disclosed the caecum and appendix to be filled with small round calcareous masses, considered by him to be cherry stones. In these so-called stones we have the first fecal concretions on record.

The nineteenth century medical literature is more replete with references to the appendix. Parkinson, a physician of London, in 1812 draws attention to the case of a child who died with all the symptoms of appendicitis as we know them, and on whom a subsequent autopsy revealed a perforated appendix. In this case we have the first record of a death from perforation of the appendix, and the subsequent sequelae.

A chemical analysis was made of fecal concretions found in an appendix by Wegeler in 1813. The true nature of the concretions was surmised as a result of the analysis, but the finding was not of much importance at this time.

Appendicular lesions came to take a more definite place in disease classifications about this time, however, the work of Llover-Villermay, a native of France, being the instrument of the moment. Villermay in 1824 published an article in a French medical journal containing the in-

teresting report of two cases, in both of which the patients complained of sharp pains in the right iliac fossa, and of much vomiting. Death ensued in each case. Gangrenous appendices were found existing at both autopsies.

Villermay classified the symptoms with great accuracy, and the report he made subsequent to the autopsies opened up the way for the observations of another mind, one Métier, likewise a son of France.

Using the two cases recorded so carefully by Villermay, and citing as well three of his own, Métier points out that appendicular lesions by no means deserved the obscurity hitherto accorded them, as being somewhat of a rarity. Had not two of his cases come under the observation of one physician, and within a very short time of each other, and was he not able to cite three similar cases of his own clinic? Surely such lesions were by no means unusual!

Métier draws attention to a case showing at autopsy an immense abscess, to which part of the caecum, together with the appendix, was adherent, the latter communicating directly with the abscess cavity. Comparing this with his acute cases, he says: "I am constrained to believe that here also the appendix caeci was the original source of evil. That there had been a collection of fecal matter in its cavity, perhaps even a stercoral calculus, and that the appendix, acutely inflamed, had become adherent to the peritoneum, the adjacent cellular tissue being engorged and an abscess forming in consequence of the perforation of the appendix."

In this viewpoint we have a clear recognition of the common causal relationship of the appendix and chronic suppuration in the right iliac fossa. The precepts advanced by Métier entitle him to all credit in first recognizing the chronic form of appendicitis, and of the causal relationship between this chronic affection and suppurative tumors occurring in the right iliac region, as also of the comparative frequency of occurrence of this condition, and the more acute variety.

The establishment of these points rounds out the first stage in the evolution of knowledge concerning the vermiform appendix.

Primary lesions were definitely recognized as occurring in the little organ by Métier, and this fact should thereafter have greatly modified medical consideration of right iliac disorders.

We now come to one of those curious lapses following a new train of thought with which the history of medicine, indeed, of science, is replete. Perhaps Métier was ahead of his time, for after all surgical treatment as a palliative for appendicitis really could not have advanced far under the then existing conditions, in a period before the work of Lord Lister changed the whole scheme of things in the field of surgery.

Following Métier's work we find the trend of thought on abdominal diseases dominated by Dupuytren, the accorded greatest surgeon of his time.

Dupuytren preferred to take an exactly opposite view to that advanced by Métier. Didactically he states that the structure of the ileocaecal valve, and the caecum itself, were the factors determining the frequency of right iliac fossa conditions as opposed to those occurring in the left iliac region. The appendix he chooses to discount entirely as an influence in such a determination. His theory held that right iliac suppurative tum-

ours arose from caecal disturbance, and despite many strenuous objections from followers of Métier, it was the prevailing viewpoint for the next 50 years.

Many minor reports of primary lesions encountered in the appendix were placed on record by various observers during this half century, but it remained for the German School of Medicine again to actively bring up the question of lesions of this organ.

A study of the literature during the twenty-five years that the German school held sway seems rather discouraging. Many learned discourses on the subject were printed, but in all of them the writers seemed at a loss to explain the symptoms they so aptly described.

Goldbeck, perhaps the most famous medical writer of this time, describes in 1830 a clinical picture of inflammation of the appendix which is most accurate. He ends, however, by admitting complete failure to interpret the symptoms in question, and this some three years after Métier's admirable hypothesis. Goldbeck invented the unfortunate name perityphlitis, and in so doing succeeded in diverting attention still further from the organ really at fault.

Burne, an Englishman, in 1837 introduced the name tumphlo-enteritis, and despite some really excellent work on right iliac abnormalities, really hindered progress by this choice piece of meaningless nomenclature.

Hodgkins, a contemporary of Burne, gives some excellent autopsy records of appendix lesions, as do Addison, Bright and Copland, also of the English school. The latter physician discriminates for the first time between inflammation of the appendix, inflammation of the caecum, and inflammation of the pericaecal tissue.

Copland first suggests the possibility of trauma, and physical exertion exciting these conditions.

"Typhlitis," suggested by Albers in 1838, led thought even further astray from the appendix, and Burne's "tumphlo-enteritis" succeeded in almost completely cloaking this organ as being the possible seat of primary lesion in right iliac fossa conditions.

In 1848 Hancock, a London medical man, actually diagnosed a case as inflammation of the appendix before fluctuation appeared, and incising the mass in the iliac fossa relieved it of a quantity of turbid serum, the patient ultimately recovering. In this operation we have the first modern trend in the history of surgery of the appendix.

The beginning of the nineteenth century begins to show an inclining to the earlier views of Métier. By 1873 light cases of treatment of appendicitis by surgical procedure prior to the appearance of fluctuation, had been recorded, showing the rapid development of such therapeutic measures.

Willard Parker in 1867 made a great stride forward in operative treatment of appendicitis. This New York surgeon was convinced that it was not desirable to wait for fluctuation to appear before making incision. He believed that nature attempted to protect life by walling off the pus collection with adhesions. The possibility of ulceration of the wall of this pocket, with discharge of its contents into the peritoneal cavity, and the grave results attendant on such a happening, he recognized. Operation before fluctuation would therefore eliminate the possibility of such a rupture, and this measure he adopted as his method of treatment.

Lord Lister's principles of antiseptis, coming into general use at this time, gave a new impetus to abdominal operations.

Resection of the appendix was performed for the first time by Kronlein of Germany in 1884, following a suggestion of such a procedure made by Mikulicy, a professor of Krakow, in the same year. The result was not favourable, the appendix having been found perforated, but the operation was undoubtedly a big step forward in the abdominal surgery of that day.

We now come to the work of Dr. Reginald Fitz of Boston, mentioned at the beginning of this paper.

We must remember before considering his work and its influence on right iliac fossa diseases, that whereas up to this time many operations had been done on the appendix, they were not always understood as remedying lesions arising directly from that organ, and that up to the time of Fitz the actual name "appendicitis" was never made use of.

The essential point grasped by Fitz was that the various abdominal disorders known as perityphlitis, typhlitis, tymphlo-enteritis, caecites, etc., were really nothing but the different manifestations of morbid processes arising primarily in the vermiform appendix.

He thus swings back the pendulum of thought to the early discriminations of M^étier made fifty-nine years ago in 1827.

Fitz first used the word "appendicitis" and says, "The word was coined by me for practical purposes. I wished to draw attention to inflammation of the vermiform appendix as the primary lesion, and that to which it was to be directly applied."

The paper of Fitz found the medical profession in an expectant and receptive attitude, and his masterful presentation of the subject easily transferred the condition henceforth to be known as appendicitis from the realm of internal medicine to that of surgery, and wiped out in one stroke much of the earlier misleading nomenclature.

New operative procedures were quickly developed; coeliotomies with removal of the appendix became increasingly common. Investigation turned a very bright spotlight on this little organ, and it was fully appreciated to just what extent it had been responsible for illness and death.

The subsequent history of appendicitis follows more particularly the improvement in operative technique suggested and practised by those following Fitz, and it brings us up to the present day in which simple acute cases of appendicitis, without complications, are attended with little more risk in the hands of a competent surgeon than that arising from a mere phalangeal amputation.

Undoubtedly further developments in this particular operation can only rest with the development of individual technique. Whilst no radical changes can be reasonably looked for, the genius of man will surely do much to smooth down the small imperfections which may be still extant, and a future generation may even consider our procedures a tedious demonstration as compared to the methods of their day.

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SOME IMPORTANT POINTS IN THE ANATOMY OF THE FIFTH CRANIAL NERVE

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Summary.

The Trigeminal or Fifth Cranial Nerve is found attached to the brain-stem midway between the upper and lower borders of the pons well to its lateral side. It is a mixed nerve of which the motor root emerges from the pons immediately mesial to the place of entry of its sensory fibres, which make up by far its larger part.

The sensory root consists of the central processes of sensory nerve-cells found in the Gasserian ganglion. This ganglion is semi-lunar in shape. From the concavity of the "semilune" the central processes leave the ganglion to enter the pons; from its convexity arise the three large branches which give the nerve its name and which are called respectively the ophthalmic, the maxillary and the mandibular divisions of the nerve. The fibres contained in these branches are the peripheral processes of the ganglion cells and bring back to the brain sensory impressions from the orbital structures and forehead, in the case of the ophthalmic division; from the upper jaw with its teeth and from the cheek, by the maxillary division; and, through the mandibular division, from the lower jaw and teeth and from the chin.

The fibres of the motor root become incorporated with the mandibular division of the ganglion and are distributed, with that division, to supply the muscles of mastication.

Central Nuclei.

(a). *Motor Nucleus.* The nucleus of nerve cells, from which the motor fibres of the nerve arise, is found as a longitudinal column lying under the floor of the upper half of the fourth ventricle towards its lateral side. This column extends upwards into the grey matter surrounding the aqueduct of the midbrain and is consequently known as the "mesencephalic root" of the nerve. The axonal processes become grouped together at the lower, or pontine, end of the nucleus and proceed ventrally to emerge from the surface of the pons.

(b). *Sensory Nucleus.* The central processes of the sensory cells of the Gasserian ganglion enter the pons and end by synapsis round the nerve cells of a nucleus which is situated immediately lateral to the motor root of the Vth in the floor of the fourth ventricle. This nucleus is of great longitudinal extent running downwards through the pons and medulla to end in the substantia gelatinosa Rolandi of the upper cervical spinal cord. This long sensory nucleus is spoken of as the "ascending" root of the Vth nerve.

It seems probable on clinical grounds that the cells of the upper part of the nucleus receive the "touch" fibres of the whole of the trigeminal area, whereas the lower part receives the fibres conveying the sensations

of pain and temperature. Clinical observations go to show that pain and temperature sensations from different parts of the face go to differing points on the ascending or sensory nucleus, and some observers believe that the lower or spinal end of the nucleus receives such sensory fibres from the "ophthalmic" area; the middle portion from the "maxillary" area and the upper part from the "mandibular" zone.

In examination of a case suffering from occlusion of the posterior inferior cerebellar artery Stopford found, among other physical signs, a loss of pain and temperature sensation of the lower part of the "ophthalmic" and of the "maxillary" areas of distribution of the trigeminal nerve on the affected side. This artery supplies a narrow strip of the medulla, including a portion of the ascending root of the Vth. The portion damaged by occlusion of its artery of supply in his case received pain and temperature sensations from the maxillary and the lower part of the ophthalmic divisions of the nerve, and hence this observation demonstrates clearly the specificity of differing parts of the sensory nucleus of the Vth to different areas of the trigeminal distribution.

The sensory nucleus of the Vth nerve has two very important relationships. It is intimately connected with the motor nucleus of the facial nerve, and so provides the necessary reflex arc for the automatic protective closure of the eyes to a strong stimulus applied to the skin of the face. Also, the sensory nucleus is in close contact with the sensory nucleus of the vagus nerve. The headache due to irritation of the vagus endings in the stomach, or elsewhere, is probably a referred pain. The painful impulse reaches the sensory nucleus of the vagus, overflows into the sensory nucleus of the Vth, and by this nucleus is referred to the recurrent meningeal branches of the latter nerve.

Superficial Origin.

As regards the superficial origin of the nerve from the ventrolateral aspect of the pons little further need be said, except that it may be pressed on by tumours arising in the angle between the cerebellum and the pons. The nerve runs forwards and outwards below the tentorium cerebelli and further forwards lies directly on the apex of the petrous portion of the temporal bone. Near its termination it passes under the superior petrosal sinus, and here it is relatively fixed in position, so that any distortion of the brain-stem is liable to cause "kinking" of the nerve.

After a course of 2.0 cms the sensory root of the nerve reaches the hilum or concavity of the Gasserian ganglion.

The bundle of motor fibres lies deep to the sensory root, a relationship which it maintains with respect to the Gasserian ganglion.

Gasserian Ganglion.

The Gasserian ganglion lies in a shallow fossa on the antero-superior aspect of the apex of the petrous portion of the temporal bone. It is intimately surrounded by an investing sheath of dura mater, the cavum Meckelii. The inner part of this sheath of dura rests below directly on the internal carotid artery, which becomes therefore an important relation of the ganglion. Above the ganglion is the uncus of the hippocampal gyrus of the brain. The inner margin of the ganglion is in intimate

contact with the lateral wall of the cavernous sinus and, in the days when the ganglion was removed for the relief of neuralgia, this was a relationship with which the surgeon found it most difficult to deal, on account of the profuse haemorrhage which occurred if the lateral wall of the sinus was ruptured.

Ophthalmic Division.

This division runs horizontally forwards in the outer wall of the cavernous sinus immediately below the Trochlear Nerve which, in its turn, lies below the Oculomotor Nerve. These three nerve trunks are therefore extremely likely to be implicated together in diseased conditions of the cavernous sinus. It must further be remembered that the bone lying between the two cavernous sinuses contains the sphenoidal air sinus. Thus, sphenoidal sinus disease can easily infect the cavernous sinuses and thence can spread to the oculomotor, trochlear and ophthalmic nerve-trunks lying in their outer walls.

At the anterior extremity of the cavernous sinus the ophthalmic nerve splits into its three terminal divisions, the lacrimal, nasociliary and frontal nerves. These all enter the orbit through the superior orbital fissure, in which part of their course they may be damaged by fractures of this region of the skull.

The lacrimal nerve runs outwards to the lacrimal gland, in which the majority of its fibres end, a small number extending further forwards to supply a portion of the conjunctiva with its sensory fibres.

The nasociliary nerve is principally concerned with the supply of sensory and trophic fibres to the tissues of the eyeball and, if this branch is damaged, the cornea becomes insensitive. Insensitivity of the cornea is the principal drawback to operative procedures on the Gasserian ganglion. In recent years the method of operating has been improved so as to render complications from this cause less likely to arise, in that the trophic nervous control of the cornea is probably left intact after the modern operation of section of the sensory root of the ganglion for the relief of trigeminal neuralgia.

The frontal nerve runs horizontally forwards under the bony orbital roof. It divides into a supraorbital and supratrochlear division, both of which reach the forehead by turning upwards round the bony supraorbital margin. The supraorbital nerve, in the region of its upward turn, comes into relation first, with the floor and then with the anterior wall of the frontal sinus, and is only separated from the mucous membrane of that cavity by a plate of bone of very variable thickness. Thus supraorbital neuralgia is frequently a symptom of inflammation of the frontal sinus. The severe pain experienced on pressing the supraorbital nerve firmly against its underlying bone is made use of by the clinician in differentiating between simulated and real states of unconsciousness.

Maxillary Division.

There are two relationships of outstanding importance in connection with this nerve trunk.

The first is the sphenopalatine ganglion, which hangs suspended by the sphenopalatine nerves from the maxillary division. A neuralgia con-

fined to the maxillary division of the Vth is thought, in some instances, to have its origin in the sphenopalatine ganglion and operations have been planned for the removal of the ganglion in such cases.

The second relation of the nerve is the maxillary sinus. The main trunk of the division crosses the roof of this sinus and, quite frequently, lies immediately under its mucous membrane. The superior alveolar branches reach the upper teeth by passing downwards in the bony lateral wall of the sinus. Hence the importance of careful examination of the maxillary sinus in cases of upper dental or infraorbital neuralgia.

Mandibular Division.

This trunk contains all the motor fibres of the nerve and, at its exit through the foramen ovale, is frequently involved in fractures of the middle cranial fossa. Such a lesion will manifest itself therefore, not only in anaesthesia of the lower lip, lower gum, lower teeth and tongue, but also in wasting of the masticatory muscles on that side. This latter is shown clinically in some hollowing of the temporal fossa, by a flattening over the masseter, when compared with the opposite side, and by deviation of the jaw to the side of the lesion when the mouth is opened.

Immediately after the exit of the mandibular division through the foramen ovale it breaks up into an anterior and a posterior division. The former is composed practically completely of motor fibres and the physical signs resulting from injury of these have been dealt with in the last paragraph.

The posterior division of the mandibular trunk divides into three branches, the auriculo-temporal, the lingual and the inferior alveolar nerves.

The auriculo-temporal nerve runs upwards in front of the ear to the side of the scalp. In addition to bringing back sensory impressions from the scalp, branches of this nerve ending in the external auditory meatus, tympanic membrane and the temporo-mandibular joint supply the afferent pathway to the brain from these structures. Incorporated with the auriculo-temporal are axons from the glossopharyngeal nerve, which supply secretory fibres to the parotid gland. They reach the auriculo-temporal nerve through its connection with the otic ganglion.

The lingual nerve, in its course downwards to the tongue, shows an important relationship, in that it lies immediately under the mucous membrane of the floor of the mouth in intimate relation with the roots of the last molar tooth. It is consequently sometimes damaged by dental forceps during the extraction of this tooth. The chorda tympani fibres which are incorporated with the lingual nerve are derived from the facial nerve. They are both efferent and afferent. The efferent fibres transmit secretory impulses to the submaxillary and sublingual salivary glands. The afferent fibres carry to the brain sensations of taste from the anterior two-thirds of the tongue.

The inferior alveolar nerve enters the mandible through the inferior alveolar foramen and runs forward in the bone supplying the lower teeth. At the mental foramen it divides into a mental and an incisor branch. The former leaves the bone by the foramen to supply the skin of the point of the chin; the latter continuing its course forward in the bone to supply the incisor teeth.

The inferior alveolar nerve is occasionally torn in extraction of molar teeth, as malshaped roots of these teeth sometimes completely encircle the main nerve trunk (Keith). It is also liable to damage in fractures of the lower jaw.

Inferior dental neuralgias, for which no definitely carious tooth can be found as a cause, must always be looked upon with suspicion as possibly being the earliest sign of a trigeminal neuralgia.

THE POSTERIOR POSITION

K. C. McCARTHY, '25

(From a paper read before the Seventeen Club, Nov. 20, 1924)

THERE is nothing easier than a normal vertex anterior position in which everything is going according to rule, but there is nothing more alarming to an inexperienced obstetrician than some malposition in which he is doubtful as to diagnosis or management. Probably the commonest abnormality that the average general practitioner engaged in obstetrics meets with is the Posterior Position.

Incidence

The vertex presents in 96% of all cases and of all vertex presentations the anterior is much the commoner. It was formerly given as 95% of vertex presentations, but recent figures of Plass are probably more accurate. From a series of 5,800 cases there were as follows: Anteriors 66.7%, Posteriors 11.3%, and Transverse 21%. These latter were usually from cases more advanced in labour and are considered as posteriors in the process of rotation. Thus it would appear that the higher percentages given by earlier writers are due to delay in diagnosis and that the posterior position is more common than has been supposed.

Etiology

The cause of this malposition is obscure. Hamilton attributes it to high heels which raise the sacrum and tilt the whole pelvis forward. The uterus is thrown forward against the anterior abdominal wall and is unable, in the later months, to descend as it should. This causes extension of the child, which is one cause of the posterior position. The compression of corsets also produces extension and causes a change in the relation of the pelvic planes to the head of the child.

The cause of the much greater preponderance of the right over the left position, 4 to 1, is the rectum, which occupies the left side of the pelvis.

The part which multiparity plays, if any, is much disputed.

Diagnosis

The attainment of an accurate diagnosis is one of the most important procedures. Normal positions require no treatment, abnormal ones recognized in time are comparatively simple. The diagnosis is made on the history and the physical examination.

(1) *History*—A small baby, as would be expected in a premature birth, is apt to have an abnormal lie. The character of previous labours should always be ascertained and the duration and measures adopted at delivery noted. There is a tendency for these malpositions to recur in the same mother and a history of difficult labour with tears in a multipara would make one suspect a previous posterior.

(2) *Physical Examination, (a) Abdominal*

Inspection—In patients with lax abdominal walls and atonic uteri the foetus can sometimes be seen. The breech is in the fundus and a prominent tumor, showing the location of the feet, can often be made out anteriorly. The arms can sometimes be seen in suitable subjects. *Percussion* is of little practical use. *Palpation*—This is by far the most valuable method of diagnosis as there is no danger of infection or discomfort to the patient. It should be carried out systematically according to Leopold's four manoeuvres: (i) The fundus—it is occupied by the irregular nodular, soft breech. (ii) The body—the firm, smooth back can be felt on one side, the nodular extremities on the other. The small parts are very easily felt just lateral to the mid line. The back is more posterior and is not so easily made out. Foetal movements are frequently felt. (iii) The lower pole—the head is grasped between the thumb and fingers of one hand and moved from side to side to determine the engagement. (iv) The cephalic prominence—on directing the fingers in the axis of the pelvis they are arrested on one side by the brow, if the head is well flexed, and this is felt anteriorly. It is important to remember that if a left position be felt, the anterior is almost certain, if a right position is diagnosed a posterior is not unlikely as 25% of right positions are posterior, while only 1.5% of left positions are posterior. *Auscultation*—The foetal heart is heard in the flanks and the sounds are muffled. Occasionally, however, in a posterior in which the head is extended the thorax may be convex and applied to the abdominal wall so that the sounds are plainly heard in front and may confuse the diagnosis.

(b) *Vaginal*—Little information can be obtained by this method until the onset of labour with the dilatation of the cervix. One first feels for the sagittal suture, noting in which oblique diameter it lies. The fontanelles are then identified. It is unusual to be able to feel both at the same time, the anterior is large and diamond-shaped and is anterior in relation to the mother. The posterior is the one most easily felt and is triangular, with the parietal bones overlapping the occipital. These are much easier to describe than to feel as the caputar membranes obscure the findings. If the cervix is sufficiently dilated one may then feel for an ear. On account of the danger of infection frequent vaginal examinations should not be undertaken and the strictest antiseptic precautions must be used. On account of these disadvantages Williams advocates the rectal examination to determine the dilatation and condition of the membranes, deciding position by abdominal palpation, thus doing away with the necessity for vaginal examinations in labour.

The character of the labour is typical. The duration of the first stage is from two to three hours longer than in the anterior position, for which the following causes have been assigned:

(1) Early rupture of the membranes causing a decrease in efficiency of the dilator.

(2) The pains are weak, irregular, and ineffectual.

The second stage is also prolonged due to:

(1) The rotation through 135° instead of 45° .

(2) The large bi-parietal diameter may have difficulty in passing between the promontory of the sacrum and the ilio pectineal eminence.

Progress

Ordinarily a vertex posterior rotates exactly as an anterior except that it goes through $\frac{3}{8}$ of a circle instead of $\frac{1}{8}$. In Plass' series 85% of the posteriors rotated to anteriors and were delivered as such. But a certain number, approximately 14% rotate posteriorly and to explain this the following theories have been advanced:

(1) Due to a lack of flexion. Flexion causes the normal rotation since the most dependent part turns to the front. Ordinarily this is the occiput, which is the first to strike the pelvic floor. When the head is extended, therefore, the forehead becomes anterior. Consequently factors which produce extension would favour this malrotation. Some of these factors are (a) funnel pelvis. In a contracted pelvis of this type normal flexion cannot take place. 34% of occiput posteriors in funnel pelvis show malrotation.

(b) An oblique position of the uterus allows the back to sag toward the side on which the vertex lies. This attitude is abnormal and any slight obstacle to descent causes extension.

(c) Multiparity with its lax muscles is given as a cause of extension by many authors.

(d) Other factors may cause extension such as spastic contractures, tumors of the neck, amniotic adhesions, etc., but are only of academic interest.

(2) Contracted outlet.—The head descends normally but its progress is checked and the occiput tends to roll into the hollow of the sacrum.

The diagnosis of persistent posterior is fairly simple. A normal labour suddenly slows up and the pains become weak and irregular. In many cases a hollow may be seen above the symphysis. On vaginal examination the anterior fontanelle is usually the only one to be felt and it is anterior with the sagittal suture running posteriorly from it. De. Lee gives a sign which he claims is constant. If there is no movement of the posterior fontanelle during a pain the condition is a persistent posterior.

Treatment

A. Antenatal.—The usual prenatal routine should be carried out in all cases. A number of schemes have been devised to convert a posterior to an anterior but the majority are inefficient and unnecessary. Buist advises external rotation to anterior and the application of a firm binder to hold the child in that position. Graswell advocates placing the mother in the knee-chest position at the onset of labour so that the back will fall to the front. Vaginal pressure is exerted to encourage flexion combined with pressure from above so that the head will engage in the anterior position. Various combinations of pads, trusses and pessaries have been suggested to hold the foetus in the anterior position, but they are without exception useless.

B. First Stage.—We should rigidly adhere to the policy of non-interference. The patient should be encouraged and reassured but no operative procedures are to be undertaken until dilatation is complete. If the labour is very long and the patient becoming unduly exhausted morphine and hyoscine twilight sleep may be used, if one recognizes their disadvantages.

C. Second Stage.—The majority of posteriors, 85%, rotate to anteriors and require no treatment beyond that ordinarily given. Of the other 14% the majority also deliver spontaneously. This is given as from 50 to 90%, depending on the length of time the different observers wait before beginning operative measures. The mechanism is as follows: The head becomes greatly flexed and elongated, the brow impinges on the symphysis, while the occiput is pushed across the perineum by flexion. Extension then occurs, the brow falls back and the head is born by extension.

When there is partial extension another mechanism comes into play. The root of the nose strikes the symphysis and the brow and occiput, by flexion, sweep over the perineum until the face slips from under the pubis. The relative distension of the vulva by the different vertex presentations may be inferred from the following diameters:

- (1) Anterior (sub-occipito bregmatic diameter), 32 cm.
- (2) I. Posterior mechanism (sub-occipito frontal diameter), 34 cm.
- (3) II. Posterior mechanism (occipito frontal diameter), 37 cm.

This explains the more frequent tears in the posterior delivery.

The trend of present opinion seems to be against operative procedures and it is felt that tears are without significance when balanced with the risk to mother and child of artificial delivery. These labours should therefore be allowed to proceed and in two-thirds of cases spontaneous delivery occurs.

For the successful delivery of those cases, which, after the lapse of a reasonable length of time, do not deliver spontaneously, there are three main methods of treatment.

(1) Podalic version.—This is useless when the head is deeply engaged or when the occiput is in the hollow of the sacrum. The hand is introduced into the uterus, the feet grasped and drawn down and the extraction carried out by Mauriceau's manoeuvre for an ordinary breech presentation. In persistent posteriors the field of version is much restricted.

(2) Manual Rotation.—This is the ideal method of delivery. The hand is introduced into the vagina and the head grasped between the thumb and fingers, the thumb being over the anterior ear. The forearm is then pronated, rotating the head. It may be necessary to push the head up slightly in order to obtain satisfactory rotation. One then waits for a pain and the hand is withdrawn, allowing the uterine contraction to fix the head in its new position. The difficulty about this manoeuvre is that the head tends to slip back again before spontaneous delivery occurs. Most authorities therefore recommend the immediate application of forceps. Various procedures have been suggested to overcome this tendency of the head to return to its former position.

Lockie carries out manual rotation in the usual manner and then applies forceps with his other hand, holding the head all the while to prevent it turning back. De. Lee, after manual rotation, fixes an artery

forceps in the scalp of the child to hold the head while forceps are being applied.

(3) Forceps Rotation.—This was first done by Scanzoni in Germany, 1853, and Bill's modification briefly is as follows: The blades are applied with the pelvic concavity towards the face. Rotation is then carried out, swinging the handles in a wide arc, until the posterior fontanelle becomes superior. Slight traction is then used to fix the head and the blades are removed and reapplied in the ordinary manner, the posterior blade being introduced first. Ordinary forceps extraction is then carried out. Scanzoni's manoeuvre is popular in many clinics in Europe and America, but here is regarded as a difficult and dangerous procedure.

Some cases may still resist treatment and for these Lockie advises direct traction with forceps. Extensive tears result but in these cases it may be the only method of delivery.

If all these measures fail it is almost certain that the head is too large to pass through the pelvis and this should have been recognized before the onset of labour by pelvimetry and accurate pelvic exploration. We then pass out of the field of the general practitioner to that of the specialist, who may decide upon pubiotomy, Caesarian section craniotomy, etc.

Conclusions

The posterior position is a condition present in 11% of vertex presentations. Of occiput posteriors 85% rotate to anteriors and are delivered as such, 10% will deliver spontaneously as posteriors and the remainder require operative measures. The main cause of mal-rotation is pelvic deformities. The treatment of persistent posteriors is manual rotation. The chief dangers of the posterior position are:

- (1) Infection from the manipulations.
- (2) Foetal injury from prolonged compression or attempts at extraction.
- (3) Tears.

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THE UNIVERSITY OF TORONTO

THE RETICULO-ENDOTHELIAL SYSTEM

IT has been known for many years that large mononuclear cells in the spleen and liver are active as phagocytes for the destruction of effete red blood cells. Over ten years ago McNee, a Scot working in London and on the European continent, emphasized the importance of the Kupffer cells of the liver in blood destruction. In addition, the Kupffer cells are known to be very active in phagocytosing bacteria and other objects of a deleterious nature in the portal blood.

During the last few years Aschoff, famous for his description of rheumatic nodules in the heart muscle, has pointed out that the Kupffer cells are merely part of a "reticulo-endothelial system", composed of cells distributed widely throughout the body. The cells of the system are noteworthy for their ability to ingest, not only formed objects, such as bacteria, red cells, etc., but also *dissolved* material, such as carmine dye, hemoglobin, etc. By means of dyes such as carmine and trypan-blue, the cells of the reticulo-endothelial system have been selectively stained and are discovered in the endothelium of liver, spleen, lymphatic tissue generally, and in the meshes of practically all the connective tissue of the body.

The various parts of the system are physiologically related, and are rather unlike, at least in some respects, histologically. Just what the various functions of these cells may be is poorly known, but some have been discovered. They destroy red cells, and break down hemoglobin to form bilirubin and biliverdin. They are more than suspected of being active in the formation of certain antibodies. That their relation to the defensive forces of the body is very intimate seems to be clearer the more they are studied. In the clinical condition known as hemolytic jaundice they seem to be overactive. The question arises as to whether hyperactivity of the reticulo-endothelial system may not be the cause of hemolytic jaundice, as well as certain of the anemias, such as that seen in Banti's disease. Such questions cannot be answered as yet, but are being eagerly asked, and clinicians as well as physiologists eagerly await the answers.

FACULTY NOTES

Medical At-Home

By the time this issue goes to press the annual Medical At-Home will be near at hand. This event, which is always eagerly anticipated by the students, is being held at Hart House on February 6th, and tickets are to be \$4.00 each.

This departure from the established custom of holding the dance at the King Edward Hotel should in no way diminish the attractiveness of the function, since the committee have worked energetically to make the At-Home surpass all previous performances.

Jardine's Orchestra will be in attendance, the best "sit-down" supper Hart House can serve will be provided, and many interesting novelties are to be introduced.

Daffydil Night

The Annual Medical Stunt Night will be held this year on February 12th and 13th. The steady improvement in Daffydil noted in the past few years will no doubt be continued by this year's presentation.

